

REMARKS

Applicant respectfully requests reconsideration in view of the foregoing amendments and the remarks herein below.

Specification Objections:

The Abstract has been rewritten to reduce the word number count below 150.

Reference sign 53 has been mention in the discussion of Fig. 2 in the amended paragraph on page 11.

The text referring to signal $b(x,y)$ has been replaced with $h(x,y)$ to conform the drawings.

Claim Objections:

Claims 2 and 6 stand objected to on formal issues.

The Examiner's objection to Claim 2 is believed overcome by the present amendment.

The Examiner's objection to Claim 6 is traversed. It is true that the term "stop" is used in photography to define an aperture setting that indicates the size of the lens opening. Changing the shutter speed also affects the amount of light reaching the image sensor. The term "stop" is used by those skilled in the art to define a change in exposure by a factor of two. If the amount of light reaching the image sensor is doubled or halved, regardless if by means of aperture or shutter speed, the exposure is said to be changed by one stop. The term is also commonly used when referring to the sensitivity of image sensors. See, for example, the definition of "stop" at <http://www.shortcourses.com/choosing/glossary/19.htm>.

Rejection of Claims under 35 U.S.C. 103:

Claims 1, 3-6, and 8-17 stand rejected under 35 USC 103(a) as unpatentable over Merrill in view of Melen. The rejection is respectfully traversed.

According to a feature of the present invention, the digital image output from image sensing device 10 has fast and slow photosites (fast and slow, or red, green and blue each existing as fast and slow photosites) but produces only a single value at each pixel location. Thus, the digital image is a sparsely sampled. However, by practicing the present invention, one can obtain a pixel value corresponding to an exposure for each of the red, green, and blue exposures at

each photosite location. The pixel values of the sparsely sampled high resolution digital image output from the A/D converter 14 constitute a sparsely sampled image having red, green, and blue pixel values at neighboring pixel locations.

Merrill's image sensor comprises sets of large and small photodiodes 12 and 14 that are matched in pairs. A single pair of large and small photodiodes produces a single output value as shown in Merrill's Fig. 4 and best described in col. 3 line 57 to col. 4 line 13.

Claim 1 of the present application calls for a "sparsely sampled high resolution digital image having fast pixel values produced by the fast photosites and slow pixel values produced by the slow photosites." Thus, Claim 1 requires each photodiode (fast or slow) to be associated with a pixel value in the image. In contrast, Merrill discloses a pair of photodiodes, one large and one small, that work together to produce a single pixel value. Accordingly, Merrill does not meet the structure quoted above in this paragraph and set forth in paragraph a) of Claim 1.

Nor does either Merrill or Melen disclose the structure set forth in paragraph c) of Claim 1. The Examiner incorrectly equates dynamic range with bit precision in Melen's col. 4 lines 56-62. As described in the present application, dynamic range relates to the range of luminance that can be produced by a device (pg. 2, lines 17-18). Dynamic range is not related to the numerical range used to represent the luminance values. For example, consider two devices that change temperature; one going from 0°C to 100°C and the other from 32°F to 150°F. Clearly, the first device has a greater temperature range, although the numbers used to express temperature is greater with the second device. Similarly, Melen's step of matching bit precision is simply changing a numerical scale that does not affect the dynamic range (the range of luminances) that is represented. An example of an encoder for reducing the dynamic range as set forth in claim 1 paragraph c) is disclosed in pg. 22 line 1 to pg. 23 line 10 of the present application.

The Examiner's statement of what is disclosed by the cited references does not reflect an understanding of what is claimed. Merrill fails to disclose sparsely sampled high resolution digital image having fast pixel values produced by the fast photosites and slow pixel values produced by the slow photosites of paragraph a) or the encoder of paragraph b) of Claim 1. The Melen fails to

disclose, in conceptual terms, the information undisclosed by the Merrill. Assuming *arguendo* that the references might be capable of combination, there is at least one limitation in the claimed invention that is not disclosed by the references individually or in combination. "Each element of a claim is material." *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 227 USPQ 657,666 (Fed. Cir., 1985)

It is also of note that Melen never mentions any problem of capturing images of scenes with a greater range of lightness that can be represented on a display, the problem addressed by the present application. Rather, Melen is concerned with efficient storage of stereographic images; which is a different field of image processing. Assuming *arguendo* that all features are taught by a combination of Merrill and Melen, there is no teaching or suggestion which provides motivation for a person skilled in the art to combine the references. "Where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis under §103 requires, *inter alia*, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success. See *In re Dow Chemical Co.*, 837 F.2d 469, 5 USPQ 2d 1529, (Fed. Cir., 1988). Both the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure." *In re Vaeck*, 20 USPQ 1438, 1442 (Fed. Cir., 1991) The combination of Merrill and Melen amounts to hindsight, in which the teaching of the inventor is used against its teacher.

Claims 3-6 and 8-11 depend from Claim 1 and are allowable therewith. Further, the Examiner's Official Notice with respect to Claim 4, that both the concepts and advantages of locating a digital image processor in a host computer separate from the digital camera are well known and expected in the art, is traversed by applicant. The Examiner should cite a reference in support of such an assertion, which addresses the limitations of the claim. MPEP 706.02(a) Similarly, the Examiner's Official Notice with respect to Claim 10, that storing two digital images in the same digital image file are well known and expected in

the art, is traversed by applicant. The Examiner should cite a reference to in support of such an assertion, which addresses the limitations of the claim.

Claim 12 sets forth a method for generating and storing an extended range dynamic range digital image comprising steps that define patentable subject matter over the cited art for the same reasons as discussed above with respect to Claim 1. Claims 13-16 depend from, and are patentable with, Claim 12.

Claim 17 defines an image capture system that is distinguished from the cited art in the same manner as Claim 1.

Claims 2 and 7 stand rejected under 35 USC 103(a) as unpatentable over Merrill in view of Melen and Bayer. The rejection is respectfully traversed on the basis that they depend from Claim 1 and are allowable therewith.

It is respectfully submitted, therefore, that in view of the above amendments and remarks, that this application is now in condition for allowance, prompt notice of which is earnestly solicited.

Respectfully submitted,



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